



# 2021 Mary P. Dolciani Prize

**Amanda L. Folsom** was awarded the 2021 Mary P. Dolciani Prize at the Annual Meeting of the AMS, held virtually January 6–9, 2021.



Amanda L. Folsom

## Citation

The Mary P. Dolciani Prize for Excellence in Research is awarded to Amanda L. Folsom, professor of mathematics at Amherst College, for her outstanding record of research in analytic and algebraic number theory, with applications to combinatorics and Lie theory, for her work with undergraduate students, and for her service to the profession, including her work to promote the success of

women in mathematics.

Folsom's research centers around the theory of mock modular forms and their relatives. Classical modular forms are complex functions on the upper half plane that have an invariance property under the action of the modular group; it was a profound study of their relationship to number theory that led to the proof of Fermat's Last Theorem. Mock modular forms have their roots in the work of Ramanujan, who proposed a number of functions that were "almost" invariant like a "real" modular form, but not quite. While Ramanujan didn't formally define "mock modular forms," over the past few decades, the work of many mathematicians has clarified the relationship of mock modular forms to more classical objects, while at the same time generalizing them and highlighting the important combinatorial implications of the theory. Folsom has played a key role in this program, showing, with a variety of collaborators, how the theory of mock modular forms and their generalizations yields insights in situations as diverse as the representation theory of vertex algebras and Lie superalgebras, convex geometry, and a variety of combinatorial problems such as counting unimodal sequences of integers.

Folsom is an active collaborator with undergraduates, successfully bringing students into her research field, and has coauthored five papers with thirteen undergraduate coauthors. Folsom is also a dedicated expositor, working to explain her research field as well as aspects of the mathematical profession to a more general audience through articles in journals such as the *Notices of the American Mathematical Society* and *Philosophical Transactions of the Royal Society A*. She has twice been a research advisor and coedited a volume for the Women in Numbers workshops at Banff. She currently serves as Department Chair of Mathematics and Statistics at Amherst.

## Biographical Sketch

Amanda L. Folsom received her PhD in mathematics in 2006 from the University of California at Los Angeles under the supervision of William Duke. She held postdoctoral positions at the Max Planck Institute for Mathematics and the University of Wisconsin-Madison between 2007 and 2010 and joined the mathematics faculty at Yale University in 2010. Folsom has been a mathematics faculty member at Amherst College since 2014. She has held temporary visiting positions at the Max Planck Institute for Mathematics and the Institute for Advanced Study. She was the recipient of an NSF Career Award from 2013–2019, and in 2018–2019, she was named a Simons Fellow in Mathematics. She has published over forty research articles on different aspects of the theory of modular forms, most notably on harmonic Maass forms, mock modular forms, and quantum modular and Jacobi forms. These papers have appeared in some of the most important international journals in number theory, including *Compositio Mathematica*, *Acta Arithmetica*, *Crelle's Journal*, and the *Journal of Number Theory*. Her book *Harmonic Maass Forms and Mock Modular Forms: Theory and Applications*, written with Kathrin Bringmann, Ken Ono, and Larry Rolin, won the PROSE Award from the Association of American Publishers as the Best

Scholarly Book in Mathematics of 2018. She serves on the editorial boards of the *Proceedings of the American Mathematical Society*, the *Journal of Number Theory*, and *Research in Number Theory*. She has twice been a von Neumann Fellow at the Institute for Advanced Study in Princeton, received a Simons Fellowship, and has received multiple NSF individual investigator awards, including a CAREER award.

### Response from Amanda L. Folsom

I am truly honored and grateful to receive the 2021 Mary P. Dolciani Prize for Excellence in Research. Thank you to the American Mathematical Society and to the Mary P. Dolciani Halloran Foundation for establishing this prize and for recognizing mathematics research at non-PhD-granting institutions. There are many mathematicians deserving of this recognition. I sincerely thank all of my wonderful colleagues in the Mathematics and Statistics Department at Amherst College. I am very grateful to work both at a college and in a department that are supportive in general and of research specifically. There are many people in the profession who have helped me throughout my career, and I am thankful to all of them. In particular, I would like to thank my PhD advisor Bill Duke and my postdoctoral mentor Ken Ono for years of mentorship, teaching, support, and advice. Thank you to all of my coauthors, including my student coauthors, who I am always learning from. I am also grateful for support provided by the National Science Foundation during my career. Finally, thank you to my family for their constant support.

### About the Prize

The Mary P. Dolciani Prize is awarded by the AMS Council acting on the recommendation of a selection committee. The members of the committee to select the 2021 winner of the Mary P. Dolciani Prize were:

- Linda Chen
- Jeremy T. Teitelbaum
- Ismar Volic

The AMS Mary P. Dolciani Prize for Excellence in Research recognizes a mathematician from a department that does not grant a PhD who has an active research program in mathematics and a distinguished record of scholarship. It is funded by a grant from the Mary P. Dolciani Halloran Foundation. Mary P. Dolciani Halloran (1923–1985) was a gifted mathematician, educator, and author. She devoted her life to developing excellence in mathematics education and was a leading author in the field of mathematical textbooks at the college and secondary school levels.

The winner of the inaugural Dolciani Prize (2019) was Stephan Ramon Garcia.

### Credits

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